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Sealift

MAGAZINE OF THE MILITARY SEALIFT COMMAND

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RIGEL UNDER WAY

MSC Commander Rear Adm. Sam H. Moore (left) and Rigel master Manuel G. Vieira discuss crew training on bridge of command's first stores ship.

In late January, I had an opportunity to spend several hours aboard USNS Rigel while that MSC-manned stores ship was involved in underway replenishment training off the coast of Virginia with the fleet oiler USS Neosho.

I joined Rigel at sea, boarding the ship by Navy helicopter. With me were Capt. Charles Richelieu, Service Group Two, U.S. Atlantic Fleet, and Capt. Richard Dietz and Lt. John Howard of MSC headquarters.

Our unanimous impression as we circled Rigel before landing on her helo deck was that the ship presented a very smart appearance. That opinion was reinforced by the operations we observed during our four hours aboard MSC's first stores ship.

Under the capable leadership of Capt. Manuel G. Vieira, Rigel's Civil Service crew functioned smoothly and efficiently as they conducted cargo transfer exercises with Neosho. I was most favorably impressed by Captain Vieira's dedication, as well as that of Chief Engineer Van Altman and the entire crew. Further, under the leadership of Lt. Cmdr. Harvey Richt, the Military Department appeared to be well organized and functioning effectively. It was most reassuring to witness the excellent state of readiness and training as Rigel commenced her operations as a unit of the MSC fleet.

The Navy has estimated that this ship, when fully operational, will save approximately $6 million per year because of her high productivity. This she will accomplish with a manning of about 98 Civil Service mariners and 17 military men. Principal reasons for high productivity were the modifications made in cargo handling systems, the fact that she can remain deployed for extended periods, and, as noted, the professionalism of the entire crew.

In recent years, MSC operated fleet support ships have earned many plaudits from the Navy customers they serve. I am sure that Rigel and her crew will continue to add to the reputation this command enjoys, and will provide the type of service required by the Navy's Sixth Fleet. Everyone involved in preparing Rigel for her fleet support mission can be proud of their accomplishments, and can share the future successes of USNS Rigel--newest member of the MSC fleet support team.

Commander, Military Sealift Command

Crewmen haul on line during underway training off Virginia.

COVER: A workhorse during her time, the bark Kaiulani has been a neglected monument to U.S. maritime history. Her bones have been brought home, waiting for a final resting place. Page 14

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MAGAZINE OF THE MILITARY SEALIFT COMMAND

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New Role for Canada Mail

By Linda McDaniel

SS Canada Mail, an 11-year-old 20-knot dry cargo vessel, will become Military Sealift Command's (MSC) next oceanographic research vessel. The 14,747-deadweight-ton ship will undergo extensive modifications for her new role in charting ocean bottom topography for the Naval Oceanographic Office.

Work on the 564-foot ship began in January and is scheduled to be completed in September 1977.

While owned by the American Mail Line of Portland, Oregon, Canada Mail was chartered by MSC from December 1973 until February 1974. She was transferred to the Maritime Administration by her owners in April 1974 and placed in the National Defense Reserve Fleet (NDRF) at Suisun Bay, Calif. Last July she was transferred to MSC and since then Naval Oceanographic Office and MSC engineers have been developing modification specifications.

Canada Mail, to be renamed when she goes to work for the oceanographic office, will take over tasks performed by the 30-year-old USNS Michelson which was placed in the NDRF last April.

Two of the three other MSC oceanographic survey ships, USNS Dutton and Bowditch, recently were overhauled to extend their operational life span another 10 years. The third, USNS Wyman, is the youngest of the command's survey ships. All are operated by MSC for the Naval Oceanographic Office.

Lt. Cmdr. Donald Puccini, assistant program manager of the command ocean survey program office, which oversees the scientific programs conducted on the ships, stressed the need for the Canada Mail. "We were not only short one ship with the lay-up of the Michelson," he said, "but our requirements increased at the same time."

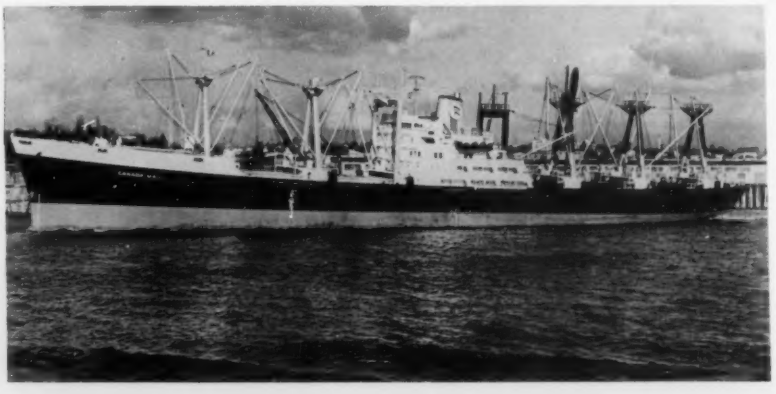
Commander Puccini feels the Canada Mail will be more efficient and economical than her predecessor for several reasons. "Since the Canada Mail is faster than the Michelson, less time will be spent traveling from one survey site to the other," he said. "In addition, Canada Mail will be the least expensive of the four ships to operate per survey mile." One reason for the Canada Mail's economy is her long range which cuts down on port calls. Modifications will extend the Canada Mail's range from 14,000 to 20,000 miles.

Nobuo (Sam) Yamamoto, head of the MSC electrical engineering branch who helped prepare the preliminary design plans, said "berthing quarters will be modified to accommodate 59 Civil Service crewmen and 49 scientists and technicians." While operating as a cargo ship, Canada Mail had berths for 75 crewmen and 12 passengers.

"As a former commercial vessel, the ship has crew quarters which are somewhat better than those on most government owned ships," Yamamoto said. Crew quarters to be added will be comparable.

Yamamoto said all cargo handling equipment will be removed and scientific equipment such as a gravity meter, a magnetometer to measure magnetic fields and a satellite navigation system will be added. ⚓

Nobuo Yamamoto checks design plans to convert SS Canada Mail into an oceanographic vessel.



SS Canada Mail will undergo extensive changes for her new role in charting the ocean bottom.

Delivered in December 1973, Brooklyn is a 225,000 deadweight ton tanker. Her stack was lowered to allow the ship to pass under East River bridges on her way to sea.

Innovation + Service = Seatrain

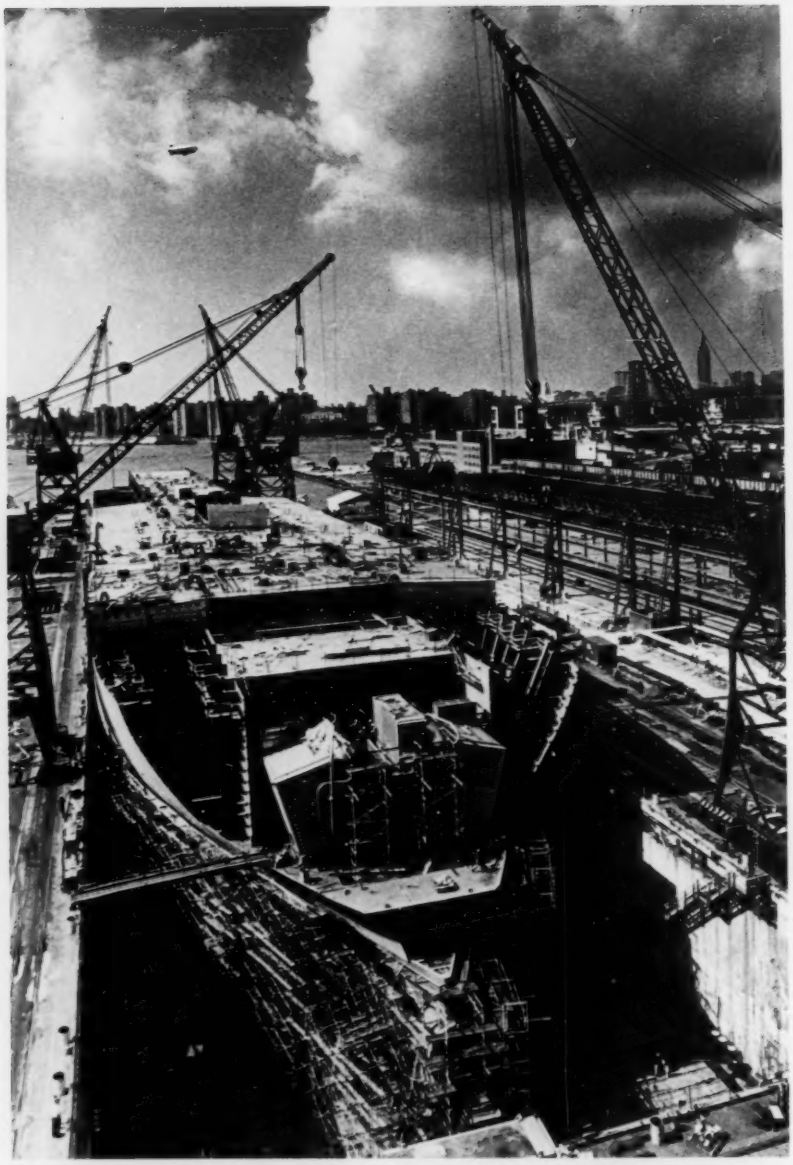
By Joseph Kahn

More than 45 years ago, in December 1929, the company now known worldwide as Seatrain Lines, Inc. took over the assets of a one-ship line called Over-Seas Railway, which carried cargo between Louisiana and Havana, Cuba. Its single ship, the Seatrain, later renamed Seatrain New Orleans, can fairly be termed the first container ship. She, and two similar vessels ordered by the new company and put into service in 1932, pioneered the first international and domestic containerized freight service, in railway cars, between New York, New Orleans and Havana.

Today, Seatrain Lines provides among the most extensive container ship service in the world operating between the United States and Europe, the Caribbean, and the Far East. In addition Seatrain is a major international tanker operator, the only U.S.-flag ship line with its own ship building facility, and a major contributor to the movement of Military Sealift Command cargo.

Seatrain has produced a startling record of pioneer ventures and innovations in the maritime field. For example, Seatrain commissioned the first high-speed container ships with gas turbine aircraft engines, pioneered the first transcontinental unit train landbridge to link Far East and European container services across the United States, initiated the first direct container service between U.S. South Atlantic ports and Europe, and the first all-container vessels on both the U.S. Gulf-Europe and Pacific Coast-Europe runs.

One of its ship operating subsidiaries, Hudson Waterways, was



The renovated former Brooklyn Navy Yard in New York witnesses the rebirth of big ships. The Brooklyn and Williamsburgh, each 225,000 deadweight tons, were the largest ever built in the United States until delivery late last year of the 265,000 deadweight ton tanker Massachusetts, built by Bethlehem Steel.

the first to develop an efficient and economical method of quickly cleaning tankers so that they could carry oil and grain on consecutive legs of the same voyage, thereby eliminating long trips in wasteful ballast. Seatrain companies also initiated the regular use of small tankers as lighters for very large crude carriers to minimize the port time required to load and unload expensive supertankers.

Its tanker Manhattan, 115,000 deadweight tons (dwt), was until recent years the largest U.S.-flag cargo carrier. Manhattan was outfitted with an icebreaker bow to pioneer the feasibility of a fabled Northwest Passage route between Alaska and the East Coast. And the Seatrain shipyard at the former Brooklyn Navy Yard in New York was the first to build U.S.-flag supertankers. The TT Brooklyn and TT Williamsburgh, each 225,000 dwt, were the largest tankers ever built in the United States when delivered.

In serving U.S. defense needs, Seatrain created virtually a new type of military cargo vessel by quick conversion of standard container and dry cargo ships for the carriage of military supplies to South Vietnam. Designed to load and unload palletized as well as containerized material with their own heavy-lift cranes, Seatrain ships also permitted roll-on, roll-off handling of trucks, tanks and construction equipment. The ships also served as mini-aircraft carriers for fly-off delivery of helicopters.

Its initial charter of 12 such vessels, for which Seatrain also provided logistical and quartermaster services both in the United States and Far East, was then the largest commercial contract ever awarded by MSC. Seatrain also chartered the first two commercially operated heavy-lift vessels to the Department of Defense, the Transcolorado and Transcolumbia, and the first commercial tanker, Erna Elizabeth, for pioneer refueling of Navy ships at sea by MSC

chartered tankers. Seatrain now operates a fleet of five Navy-owned tankers under MSC contract and supplies container ship service to the Navy installation at Guantanamo Bay, Cuba.

Seatrain's support of U.S. defense requirements dates back to its earliest days. In World War II, the company's entire fleet of five vessels was requisitioned for military service. Seatrain ships were involved in the perilous convoys to Murmansk and one vessel, Seatrain Texas, was cited for its support of British forces in Africa which contributed to the rout of Germany's crack tank corps in Egypt, a turning point in the war.

In 1947, when all of its ships had been returned, Seatrain resumed coastal service begun in 1940 between New York, New Orleans and Texas City, Texas, as well as cargo service to Cuba. Discontinuing the Havana run shortly thereafter, the company expanded its Gulf operations by adding two additional ships and, by 1951, a new terminal at Savannah, Georgia.

In 1963 Seatrain returned to the Caribbean. Within a few years its logo was a familiar sight in Puerto Rico, where a regular service delivered freight in containers and rail cars aboard train ships. Through the latter half of the 1960s Seatrain expanded its commitment to full intermodal containerization, building the largest independent container port in the United States, Port Seatrain in New York harbor. The company also placed a world record order for freight containers, and committed itself to the purchase of four gas-turbine powered high-speed container ships. Each had a capacity of 940 forty-foot containers. These vessels were among the largest and fastest container ships in the world.

By 1970 Seatrain maintained a regular service between New York and Northern Europe, between Hawaii and the U.S. West Coast, and initiated direct and feeder services along the East, West and Gulf Coasts to the Caribbean, the Pacific and the North Atlantic. Because of intense competition for cargo in the major trade routes, particularly in the North Atlantic, the early 1970s developed into a turbulent and difficult period for the container ship industry. Virtually all but the largest international carriers, those with major investments in port facilities, owning high-speed equipment and having marketing muscle, withdrew, rerouted or sharply curtailed their operations.

Seatrain, already a major company in international container trades, expanded its U.S. East Coast to North Europe services and extended fast, efficient feeder links to Scandinavia and the Iberian Peninsula. Having sold its West Coast-to-Hawaii route, it now provides direct service between the West Coast and Japan, with feeder routes to other Far East ports.

In 1972 Seatrain inaugurated the first transcontinental unit train across the United States to pioneer what had been awaited for more than a decade, a landbridge linking European shippers with those of the Far East.

Three years later, Japanese transportation authorities approved a joint pooling agreement between Seatrain and Japan Lines, using both fleets and the Seatrain landbridge, to provide direct Japan-Europe service at rates competitive with those on the all-water routes. Seatrain still provides the only full U.S. landbridge service between the Far East and Europe.

Speed, efficiency and cost-effective distribution are critical to modern world trade, and Seatrain is justifiably proud of its contribution to U.S. Merchant Marine leadership in the field. Seatrain liner and feeder ships serve U.S. ports on the East, West and Gulf Coasts, including New York, Norfolk, Baltimore, Wilmington,

Seatrain Maryland and Florida, part of a fleet of 12 Seatrain cargo vessels, carried Defense Department material to Vietnam. The ships handled combinations of containerized and palletized cargoes, plus many military vehicles.

Transcolorado, and her sister ship Transcolumbia, the only two heavy-lift ships available in the merchant fleet, were specially configured for charter to MSC. Beginning in 1968 and continuing through U.S. involvement in the Vietnam crisis, the two ships were invaluable for movement of heavy lift Defense cargo.

Charleston, Boston, Bridgeport, Oakland and Long Beach. Service to Canada is provided through Vancouver in the west and Toronto and Montreal in the east, and service to a number of points in Mexico is routed through Houston. Connecting rail services link the ports of Houston and New Orleans with the Atlantic and Pacific routes and another rail bridge connects both of these ports with Tampa, Pensacola, Mobile and Gulfport.

The Seatrain European headquarters in Rotterdam oversees six regional areas ranging from northern Scandinavia to the Iberian Peninsula, from the United Kingdom to Czechoslovakia, and on to Iran. Pacific container operations, directed from Oakland, Calif., supervise container ship service between the U.S. West Coast, Japan and Korea. Caribbean services, which link to the North and South Atlantic and Pacific routes, include ports in Puerto Rico, the Dominican Republic and Haiti.

A company subsidiary, Seatrain Agencies, Inc., last year was appointed North American general agent for Italian Line and its famous liner Leonardo Da Vinci. Reflecting the Italian flag carrier's efforts to enlarge the sphere of its freight business, the agency commitment provides container ship service from the Mediterranean to Central America, Mexico and to the East and West Coasts of the United States and Canada.

The growth of its container ship operations quadrupled company revenue, from less than $100 million in 1970 to almost $440 million last year. Commercial charter and special military operations, which accounted for approximately 75 per cent of total revenues six years ago, last year contributed only about 25 per cent. The change resulted more from the altered conditions of world trade than from a lesser commitment to the opportunities and needs of other modes of marine transport, however.

As one of the largest U.S. based, predominantly U.S.-flag ship operators, Seatrain continued to expand its fleet of tankers, bulk carriers and special military cargo vessels throughout the past decade. In fact, it was the boom in world oil tanker rates during the late 1960s and early 70s and the large fleet Seatrain had available that enabled the company to continue to support its large capital commitments in the turbulent container trades.

In 1969 Seatrain Shipbuilding Corp. took over the abandoned Brooklyn Navy Yard to become the only U.S.-flag ship operator able to build its own ships. After a major investment in renovations and installation of some of the most modern, largest and efficient steel fabrication equipment employed by any shipyard in the world, Seatrain delivered the first of a series of 225,000 dwt tankers in 1973. The TT Brooklyn and the TT Williamsburgh, delivered in 1974 and chartered to a major international oil company, were the largest tankers ever built in a U.S. yard. But with the oil embargo that year and the subsequent quadrupling of the price of oil, tanker charter rates plummeted and much of the international tanker fleet was idled. Hardest hit was the U.S. Merchant Marine.

Last year Seatrain received government support for additional financing to stretch out completion

of two sister supertankers still under construction. When the TT Stuyvesant and TT Bay Ridge are completed at the end of 1976 and 1977 respectively, it is hoped that the market for U.S.-flag tankers will have improved, primarily because of the opening of the Alaskan oil pipeline.

Seatrain Shipyard is vigorously competing for orders to meet the growing demand for oceangoing barges and other smaller ships which other shipyards had backlogged for as long as two or three years. In December 1975, within six months of its first order, the yard delivered the first of eight giant deep sea barges chartered to move heavy equipment for North Sea oil rigs. The yard also began cutting steel for a unique ice-breaking barge to be used in supplying Alaska oil fields. It is scheduled for delivery in May.

This performance will enable Seatrain Shipyard to compete for other contracts for barges, oil rigs, and smaller cargo carriers, thus providing jobs for its skilled work force until the market for giant tankers is revived.

Ability to move quickly and effectively and to take advantage of available opportunities is critical in the maritime industry, both in ship operation and shipbuilding. This has always been true, in good times and in bad. Despite its handicaps, operating in an international arena in which free trade has become almost exclusively a U.S. commitment, the U.S. Merchant Marine has acquitted itself well. U.S. technology led the world into a new era of containerization, pioneered computer-directed distribution and cargo handling, and provided leadership in nuclear propulsion and innovations in ship design.

The higher cost of building and manning U.S.-flag ships, dictated by our greater concern for the safety and living standards of U.S. workers, is increasingly being matched abroad, where inflation has outstripped the U.S. rate. As cost disparity is reduced, the U.S. fleet will again come into its own.

It is reassuring, in our nation's bicentennial year, to remember that ability and willingness to innovate, to pioneer and to invest our energies and wealth in new and better ways, have long been considered, the world over, as very much an American tradition. Seatrain is proud of its record as an innovator in the marine field. It is striving to continue that tradition.

⚓

Joseph Kahn, chairman of the board of Seatrain Lines, has been active in U.S. maritime affairs since he and an associate purchased minor interests in two old Liberty ships 25 years ago. A year later they exercised an option to buy both ships. Their company, Transeastern Associates, had become one of the major U.S. flag ship operators when they bought control of Seatrain in 1965.

Prominent in U.S. Merchant Marine activities, Mr. Kahn is chairman of the board of trustees of the Transportation Institute, president of the American Maritime Assn., and a trustee of Webb Institute of Naval Architecture.

Artist's conception of completed LNG tanker shows the five 120-foot diameter aluminum tanks that store liquefied gas. General Dynamics has orders for eight LNG ships of this class. Total cost is more than $750 million.

Where Do We Stand?

By Charles Zeien

When asked if the United States is competitive in maritime technology and shipbuilding, the advice of former baseball great Satchel Paige comes immediately to mind. He often warned, "Don't look back for someone may be gaining on you." In the race for technological and shipbuilding supremacy, U.S. maritime "runners" need not look back for they and their competitors are running in a pack. The question is who will drop back, or, who will forge ahead?

American Maritime technology has been in the forefront over many years. The United States developed the 20-knot freighter with its Mariner program in the early 1950s. U.S. shipping companies initiated containerization in the 1950s and developed it in the 1960s culminating with 32-knot container ships in the early 1970s. The United States leads the world in barge-carrying ships, having developed the earliest liquiefied natural gas (LNG) ship technology almost 20 years ago with the Methane Pioneer.

Even the early supertankers started in this country. That was about 1950 when supertankers were 30,000 deadweight ton (dwt) vessels. For many years most were built in U.S. shipyards. U.S. shipbuilders lost the lead to Japan in this area after pioneering efforts culminated in the construction of the 115,000 dwt SS Manhattan. Indeed it is difficult to find an area where U.S. ship technology has not been dominant. It is unquestionably true in warship technology, in development of offshore oil field rigs, and in construction of research submersibles. So, the real question to ask is: What will the future be like?

The future usually involves building on experience with some bias to a direct extrapolation normally based on factors we can identify. Unfortunately, this

process inevitably leads to completely missing some really important factors that will exist when the "future" finally arrives.

This phenomenon is labeled the "step function." It is, for instance, the sudden change in the growth curve caused by some unanticipated factor, good or bad, which throws projections out of kilter. The Arab oil boycott of 1973 was a step function affecting trends in the energy area. Even now, we do not fully understand the full impact of this step function. Clearly, in 1970, anyone concerned with technology and shipbuilding would have made a poor assessment of U.S. status had he failed to identify this important step function, and make his predictions with this factor as an underlying assumption. So, while it is relatively easy to review current trends, identification of possible step functions is precarious.

Certainly, we can expect to see in this century some tankers of one million deadweight tons, perhaps two million. While the technology to design and build these ships does not exist today, the know-how is available. The real question is whether new workhorse vessels of the 1980s and 1990s will be that large.

I doubt it, for crude carriers may well be a dying breed as energy producing countries try to add value to their crude oil before they ship it to market. Refineries will be built at the wellhead and large product carriers will be a strong future trend—unless we have a step function resulting from either gunboat diplomacy or the discovery of major energy sources in the northern half of the Mediterranean, along the Rhine River Valley or off the East Coast of the United States. Major discoveries in these locations would create a petroleum buyers' market. It could also slow the building of refineries in the Middle East.

The relationship of shipbuilding to future energy demands has been the subject of considerable discussion. In a report during the Seatrade conference in New York in April 1975, Mr. John H. Rabbitt of Sun Oil Co. cited some very interesting statistics which I can summarize as follows:

There is a present demand for approximately 200 million dwt of tankers and in late 1974 supply and demand were approximately balanced. An additional 50 to 100 million of tanker tonnage was then on order, although cancellations made it difficult to be precise about the amount of tonnage at any given time. If energy usage increases 4.5 to 7.5 per cent per year, as forecast, a shipbuilding program producing 10 to 20 million dwt per year would appear adequate. This is less than the 1974 production of 50 million dwt.

A 1975 Norwegian forecast anticipated 60 million to 100 million dwts of laid-up tanker tonnage by year end. Over 35 million tons were inactive in late 1975, and a substantial proportion of the world's fleet was slow steaming to avoid more lay-ups. It now is clear that there will be no worldwide demand for large tankers in the balance of this decade, and perhaps well into the next decade, unless we have a step function. Although some forecasters feel oil will become a declining energy source before the current backlog of large tankers is worked off, I find that prognosis unacceptable. But, I would be unwilling to speculate as to when a shortage of large tankers will recur, although certainly not for several years.

Size of LNG vessels will increase as did that of petroleum tankers, and 400,000 cubic meter LNGs will be operating in a few decades. The LNG industry is still in its infancy and LNG is a low density product suitable for very large vessels. Since the draft of a 400,000 cubic meter LNG is about that of a 250,000 dwt tanker, the size of a vessel is no problem. Vessel draft is the significant factor.

LNG deliveries will grow significantly as developed nations realize natural gas is a clean and safe fuel, and decide to pay the price for transporting gas to their cities by ship. Alternatives such as producing gas from coal will be costly, and flaring gas is unacceptable. Petrochemicals at the gas fields cannot possibly use all of the gas produced with oil.

In effective employment of energy carrying ships, traffic control will be vitally important. Control will

The first liquefied natural gas tanker built in the United States moves into her outfitting dock at General Dynamics' Quincy Shipbuilding Division shipyard.

start in the harbors and later be extended to the coastal waters. How soon vessel owners will relinquish navigation control of their vessels will be determined by step functions like the Torrey Canyon and Queeney incidents. Similar mishaps can accelerate the time scale unpredictably.

With regard to dry cargo vessels, it is unlikely that rapid growth in the size of the energy ships will be duplicated during the balance of this century. The trend is toward bigger and faster ships with unitized cargo. High fuel costs may slow that trend temporarily, but the overriding concept remains that only service will attract cargo since freight rates generally will be equalized on any given trade route, as they have been for many years. Comparable rates result from the conference system and equalizatian probably will grow stronger as bilateralism increases.

The future also will bring container and roll-on, roll-off ships which will make 35 to 40 knots. Roll-on, roll-off ships will make continuing gains on the shorter trade routes. And, as speed increases, trade routes become shorter, figuratively speaking, and turn-around time and stevedoring costs become more important. U.S. technology has led the world in development and use of roll-on, roll-offs and will continue to do so.

The "barge aboard" concept appears to have less potential for future exploitation since more raw and semi-raw materials will be processed at their source, and inland waterway transportation must compete with subsidized highway systems. It is nevertheless conceivable that bigger ships carrying bigger barges may be more successful than now thought.

Now to some of the newer technology areas. Icebreaking ships probably will become increasingly important in world commerce, especially in movement of energy sources and raw materials. Oil will continue to be found in the most inconvenient locations and new ships with newer steels will be needed because of low temperatures at the earth's poles. U.S. technology in this field is dominant.

Fully submerged cargo ships will arouse considerable curiosity during the next 25 years but are unlikely to become significant in commercial transportation. Superior submarine know-how puts the United States in the forefront in this area but there is little potential for commercial application.

Large hydrofoils and surface effect ships will be important to the military but will have limited potential for commercial cargo delivery. Here again, this nation is technologically ahead of almost everyone else.

Nuclear powered ships will not be developed commercially until the U.S. government provides significant seed money to stimulate development of the required technology and to fund the construction and operation of several prototype vessels. This will take many years, and may not represent the best application of U.S. nuclear technology resources. It is more likely that the United States should be directing its nuclear resources toward production of electric power and development of military vessels where nuclear power can generate a clear tactical advantage.

If my conclusions are reasonable assessments of future trends, it would seem likely that the United States will supply more than its share of the needed maritime technology. None of the ideas mentioned are new. But, U.S. research activities which provide the fertile soil necessary for growth of technological concepts and systems appear to be increasing in both the government and private sectors. Profits in shipping, shipbuilding and the offshore oil marine industry were better in 1974 than in any recent year. The picture in 1975 was not as good, but U.S. maritime activities were not as hard hit as those of western world competitors, or U.S. industry generally. If the U.S. maritime industry stays healthy, maritime interests will have the fiscal support needed to finance technology developments for the 80s and beyond. There is every reason to be hopeful on both of these counts.

The second question concerns the status of U.S. shipbuilding—competitive or not?

Until the full effect of the 1970 Merchant Marine Act was felt in the early 70s, about 80 to 90 per cent

Seatrain Lines' 115,000 deadweight ton tanker Manhattan is the culmination of American pioneering efforts in supertankers. She was outfitted with an icebreaker bow for her journey through Canadian Arctic waters.

Photo Courtesy of Seatrain Lines, Inc.

of U.S. shipbuilding activities, measured in dollars or manhours, was devoted to U.S. naval vessels. Total shipbuilding activity has been comparable to the massive tanker building programs in Japan, from 3 to 4 billion dollars annually. The 1970 Act, development of Alaskan oil fields and the offshore drilling business changed the picture. In recent years, construction has been about 50 per cent commercial, supported by subsidy programs, Title 11 mortgage financing and of course superior U.S. offshore oil technology.

So, when the question is asked, "Is the United States competitive in shipbuilding?"—it is first necessary to divide the problem into parts.

With regards to naval shipbuilding, there can be no debate. The Navy will continue to build and rebuild its own fleet and a foreign market is developing for warships. The United States can compete in technology and we clearly lead in warship design. Future buyers will seek increased sophistication, especially the Arab countries which can commit substantial funds for warships. Against that framework, naval shipbuilding is competitive.

However, U.S. leadership in construction of oil rigs and offshore oil equipment is being challenged. U.S. technology has been exported and subsidies do not compensate for higher wage scales in U.S. shipbuilding. Worldwide over-capacity in oil tanker shipbuilding facilities may well find its outlet in this area since foreign governments who have been subsidizing their shipbuilding all along will surely point their ailing shipyards in this direction. Facilities used to build VLCCs can be readily adapted to building oil rigs and other offshore equipment. U.S. shipbuilders can expect increasing competition and the only available government aid is Title 11 financing. Shipbuilders may need government protectionist support in the next few years, perhaps an extension of the 1970 Act as well as increased government research.

The U.S. tanker and container ship fleets clearly have lost their competitive edge. Dependence on subsidies will increase. But, U.S. costs for these ships are higher than foreign costs, and other nations have their own subsidy programs. Governments of Japan, France, Sweden, W. Germany, Italy, etc. are not likely to close one-half or three-fourths of their shipbuilding capacity so that U.S. shipyards can prosper by getting a significant share of the shrunken shipbuilding market, using substantial government subsidy. U.S. builders are in for a cat-and-dog fight. They feel they must have enlightened government policies with subsidy and financial aid judiciously applied to preserve the industry. While U.S. yards are not cost competitive in most areas of shipbuilding, it would not really matter if they were, for each country is going to help its own industry in the highly competitive times ahead.

One must conclude that the U.S. shipbuilding industry is not competitive, nor likely to become so even with floating exchange rates and higher inflation rates abroad. "Competitive" is a word which ignores government influences which, in shipbuilding is completely unrealistic. Government policies in Japan and Europe still are being formulated. But, history suggests these governments will act to preserve their shipbuilding posture, just as our government has in the past.

The United States must do the same if competitiveness of U.S. shipyards is to be assured—and if this nation is to continue to be a dominant maritime power. ⚓

Charles Zeien joined J. J. Henry Co., Inc. in 1972 as executive vice president and became president three years later.

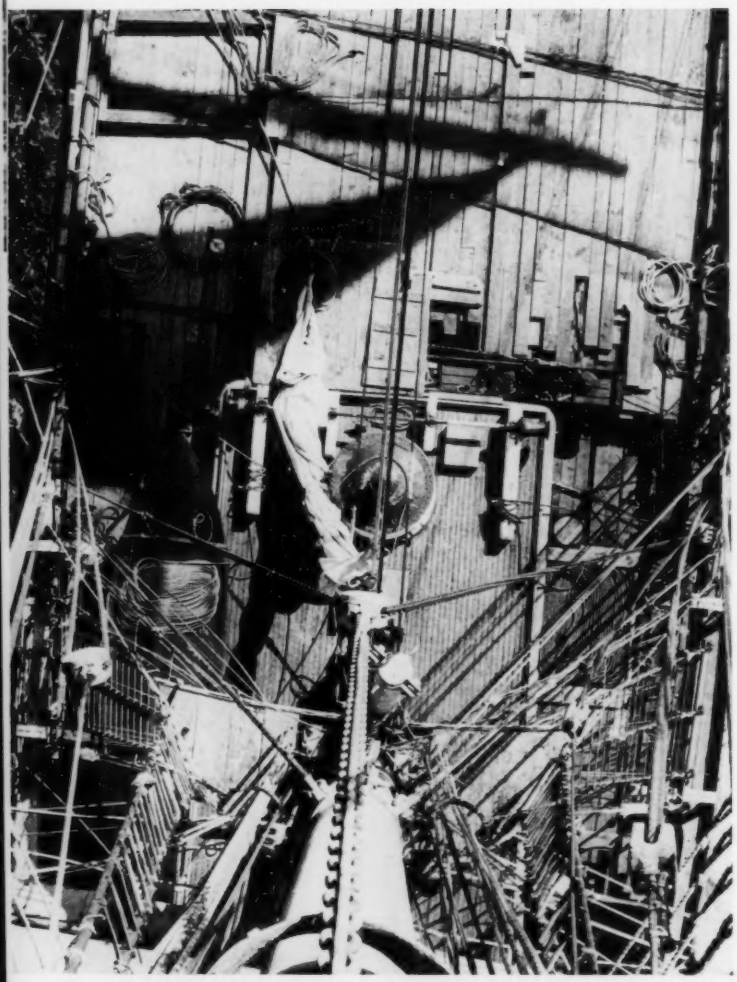
Mr. Zeien is a graduate of the Webb Institute of Naval Architecture, where he earned a Bachelor of Science degree. He also holds a master's degree from Harvard University's Graduate School of Business Administration.

Prior to joining J. J. Henry, Mr. Zeien worked with Sun Shipbuilding and Dry Dock Co. for 20 years. During that time he was responsible for the design and construction of the largest floating dry dock in the United States. He became vice president of engineering, and also served as a member of Sun Shipbuilding's board of directors.

Mr. Zeien is active in several professional groups, including the Society of Naval Architects and Marine Engineers, the American Society of Naval Engineers, the Society of Military Engineers, and the American Institute of Aeronautics. He also serves on the Maritime Transportation Research Board's National Research Council. He is also a member of the Royal Institution of Naval Architects.

From Rotten Row to Limbo

By Cindy Buckley



This view of Kaiulani's deck was taken from top-gallant crosstrees.

She was built in 1899 in Bath, Maine by Arthur Sewall. Her name, Kaiulani, means "Child of Heaven," and was the name of the young princess who was last heir to the Hawaiian throne. Kaiulani, a 225-foot, square-rigged, steel-hulled merchant bark, was the last survivor of a bygone age of sailing ships which helped write U.S. maritime history.

Built for a consortium of companies in Hawaii and San Francisco, Kaiulani hauled sugar and passengers to Hawaii from San Francisco, and salmon to San Francisco from Alaska. She was later laid up in a merchant ship anchorage dubbed "Rotten Row," appeared in a Hollywood production and sailed in World War II.

The ship now lies in 32 pieces, mostly keel and stern, at Todd Shipyards in Seattle, Wash., awaiting a decision about her future and funds necessary for her preservation. Kaiulani was brought home aboard the MSC chartered ship SS Transcolorado.

Launched on Dec. 2, 1899, Kaiulani sailed as a passenger packet and "sugar bark" on the San Francisco to Honolulu run. A one-way passage out of San Francisco cost $40, and the ship could accommodate 10 to 12 passengers. It was not unusual to see a few cows and horses aboard as well. She carried general cargo to Hawaii and sugar on the return passage.

The Alaskan Packers Co. fleet acquired Kaiulani in 1910, renamed her Star of Finland, and used her in the Alaskan salmon trade. She was one of the "Star" ships, as the Packers' ships were called, and was part of the last large sailing ship fleet under the U.S.-flag. Each spring fishermen, cannery workers, and tin plate were transported to the salmon canneries in Alaska, where the ship remained at anchor for the summer. Early in the fall the ship brought the fishing crews and the season's catch back to San Francisco.

By 1927, however, Kaiulani was no longer competitive. She became another motionless ship laid up along "Rotten Row" in the Oakland estuary of San Francisco Bay. There she stayed with one brief but glamorous interlude until 1941. Her interlude came in 1937 when the producers of "Souls at Sea," a motion picture starring Gary Cooper, had Kaiulani refitted and used her in the film.

When World War II broke out, a shortage of ships gave Kaiulani a chance for a comeback. Chartered to

the East Asiatic Co. of Denmark under her original name, she carried lumber from Grays Harbor, Wash. to South Africa, and explosives from Africa to Australia.

Late in 1941, having picked up cargo destined for Australia, Kaiulani had to seek refuge from Japanese submarines in Hobart, Tasmania, southeast of Australia.

Kaiulani's arrival in Hobart marked the end of her sailing days. The ship was requisitioned by the U.S. Army, towed to Australia, stripped of her masts, and used as a coal barge. The Army officer who supervised the conversion of the square-rigger said, "I had to give the orders to do the job, and I hated it. A beautiful ship was sacrificed to get the job done."

After the war Kaiulani was bought by the Madrigal Shipping Co. of Manila for use as a logging barge. She hauled mahogany logs from Mindinao to Manila until Oct. 5, 1964 when she was presented by Philippines President Diosdado Macapagal to President Lyndon Johnson as a gift from the Philippine people. Kaiulani is owned by the American people under the trusteeship of the National Maritime Historical Society.

Since 1964 there have been numerous efforts to restore Kaiulani as an artifact of American maritime history. One man's devotion to the ship and efforts toward her restoration, however, began in 1947. Karl Kortum, director of the San Francisco Maritime Museum, sailed aboard the Kaiulani on her last voyage, and has tried for many years to interest others in restoring the ship as she was in her sailing days.

In 1962, attorney Alan D. Hutchinson of Washington, D.C. approached Kortum with a question. Did he know of an old vessel that could be restored and displayed on the Potomac River? Kortum told him of Kaiulani. Hutchinson joined with a senior member of his law firm, James Sharp, to organize the Committee for Preservation of the Kaiulani.

"This gift from the Philippine people to the American people will eventually be berthed here in Washington as a maritime museum at the redeveloped Maine Avenue waterfront," announced a full-page ad in a Washington newspaper, asking for contributions toward Kaiulani's restoration.

Kaiulani then was rusting in the Philippines, and the plan was to rebuild the ship there and sail her back to the United States. Many people contributed, but not enough. Hutchinson and Sharp had to abandon the project.

Helen Delich Bentley, former chairman of the Federal Maritime Commission and co-chairman of the National Maritime Historical Society, had grander

Masts and spars dominated the San Francisco Bay shoreline when the Alaska Packers Co. "Star" fleet tied up for the winter at Alameda. As the Star of Finland, Kaiulani (center) is maneuvered into winter quarters.

plans for Kaiulani. She envisioned the ship as a Bicentennial envoy that would sail to major ports throughout the United States. The National Maritime Historical Society, based in New York City, backed this project, but it also floundered.

The society continued its efforts to preserve Kaiulani. Kortum suggested rebuilding the ship in the Philippines. According to Kortum, approximately 80 per cent of the original hull was intact when interest was first aroused in Kaiulani in 1960. He recommended rebuilding her around the existing frame.

The corroding effects of wind and sea, coupled with vandalism, had eaten away much of her hull. In May 1974, the society sent naval architect Charles Wittholz to survey Kaiulani with an eye toward dismantling the ship and salvaging what he could. Wittholz worked for Military Sealift Command for nine years, first in the Atlantic area command and later at headquarters. Wittholz left the government in 1962 to open his own business.

He drew up plans for salvaging parts of the vessel and for rebuilding her in the United States. He has collected all available original plans and drawings from the Sewall family and from Kortum. Restoring the ship as she stood would have been impractical, according to Wittholz. "Even in 1968 there would have been 90 per cent of the ship to renew," he said.

Accordingly, the decision was made to take the remains of Kaiulani out of the Philippines. However, a Filipino, armed with a Coast Guard permit to clean up wrecks, had been cutting scrap metal from Kaiulani. The entire main deck was gone and ragged holes scarred the ship's side. Approximately 100 tons of main deck and topsides were missing. Mrs. Bentley intervened with embassy and presidential palace officials and the scavenging was stopped.

The society then made arrangements with a local company to cut up Kaiulani, as marked by Wittholz, and to salvage the good pieces. The company was to keep the remaining scraps of Kaiulani as payment.

Kaiulani was built with open-floor construction, meaning a space of about 2½ feet was left between the steel bottom plating and the frame of the ship. Ship builders had covered the frame with heavy timbers to make a smooth surface, but there was still space to fill that was too small for men to paint and maintain. Concrete had been poured into the space, and it adhered well to the steel—so well that although the wood had rotted the concrete remained, presenting a sticky problem to the salvager.

Eventually, the salvager saved substantial sections of Kaiulani and took them to Subic Bay. There they were loaded aboard the MSC-chartered cargo vessel SS Transcolorado and transported to Todd Shipyards in Seattle, Wash.

Kortum regrets the society's treatment of Kaiulani, arguing that breaking the ship up and rebuilding her destroyed her authenticity.

Peter Stanford, president of the National Maritime Historical Society, has a different view. According to Stanford, the plan most favored was transporting remaining pieces of Kaiulani from Seattle to Bath, Maine, the vessel's birthplace, and displaying them there in a museum.

"They're trying to improvise after disaster," said Kortum of this plan.

The National Maritime Historical Society is still seeking money for Kaiulani's restoration. "We have

The 30-ton stern section rests on the deck of SS Transcolorado before being lifted onto a pier in Seattle. It is the biggest piece salvaged.

In 1937, rechristened Star of Finland, she was moved from "Rotten Row" and used briefly in the film Souls at Sea, starring Gary Cooper.

tried to raise money for 10 years because we believe in Kaiulani very strongly," said Wittholz. "There was a time in the clipper ship era when the United States was the leading nation in shipbuilding and maritime commerce, and we want to document that era with Kaiulani, the last American-built square-rigger."

Retired Rear Adm. Walter E. Schlech, chairman of the National Maritime Historical Society and former commander of MSC, Atlantic, echoes Wittholz' enthusiasm. "We are concerned with preserving America's maritime heritage," he said. Retired since 1970, Admiral Schlech has been actively involved in the restoration of Kaiulani for five years, but has followed project progress since 1964.

Various methods of funding the project have been tried. Maritime Administration shipbuilding funds could not be used for restoration of Kaiulani, and the Bicentennial Commission had no funds for such a project, said Wittholz. The Smithsonian Institution in Washington, D.C. could help, but only by securing a special Congressional appropriation, a tedious and "practically impossible" procedure, said Stanford. A $2.5 million grant proposed for Kaiulani in the early 1970s was not approved.

A national maritime ship trust bill, sponsored by Senator Edward M. Kennedy (D., Mass.) now is working its way through Congress. The bill proposes that a trust be set up to preserve ships like Kaiulani. Such a bill may not be passed in time to help Kaiulani.

Cost estimates for preservation of Kaiulani differ. Kortum puts the cost at $6 million to $8 million, while Stanford estimates $5 million. To preserve pieces of the vessel as artifacts housed in a museum would cost about $250,000 said Stanford.

The National Maritime Historical Society may have a decision soon as to how best to preserve Kaiulani, last of approximately 17,000 Yankee square-riggers built since American shipbuilding began in the early 1600s. Despite the fact that she had a relatively undistinguished career and spent practically all her life hauling goods, people and lumber back and forth in the Pacific, Kaiulani has, by reason of survival, become an icon for U.S. maritime history. "Three centuries of American shipbuilding and commerce find in Kaiulani their neglected monument," proclaimed a promotional poster 11 years ago.

Kaiulani may yet become that monument. ⚓

Hanging Around

National Oceanic and Atmospheric Administration photo

By Cindy Buckley

They don't wear gold hoop earrings, black eye patches or britches tied with red sashes, and they are not looking for troves of Spanish bullion or jewels. Neither are they seagoing sleuths seeking sunken treasures with an array of electronic search gear. Nevertheless, crews of two special U.S. Department of Commerce ships do prowl the U.S. coastline in search of sunken wrecks.

Rude and Heck, wire drag ships homeported in Norfolk, Va., and part of a 25-ship fleet operated by the U.S. Commerce Department's National Oceanic and Atmospheric Administration, locate sunken wrecks and other underwater obstacles so that they can be marked accurately on navigational charts.

In their searches, the 190-foot long, 90-ton sister ships use a system perfected early in this century by the Coast and Geodetic Survey, predecessor of the National Ocean Survey. The latter organization is a part of National Oceanic and Atmospheric Administration. Locations of wrecks are reported to the National Ocean Survey and recorded on their nautical charts, after the Rude and Heck determine the exact location and depth of water covering them. Information is then passed on to the Coast Guard, which publishes locations of hazardous obstructions in Notice to Mariners.

The ships operate parallel to each other, as much as two miles apart, and drag a quarter-inch steel wire, suspended underwater from surface buoys at depths as great as 100 feet. When the wire catches on an obstruction, the ship crews determine the location and depth of the wreckage. If necessary, divers will go down to examine the wreckage or underwater obstacle.

Generally, the National Ocean Survey designates wrecks and other submerged objects as dangerous to shipping if they are covered by less than 65 feet of water. Most merchant ships require a clearance of 45 to 50 feet, but some large oil tankers need more.

Commanded by Cmdr. Robert A. Ganse, a National Oceanic and Atmospheric Administration commissioned officer, 10-man crews aboard the Rude and Heck set out in February 1975 on a three-month voyage to investigate Atlantic coastal waters between Chesapeake Bay and the Florida Keys, and along the Florida west coast. In September, they moved north and dragged the waters of New York harbor.

Twenty uncharted sunken wrecks were reported to be lurking in the southern waters Rude and Heck were sent to investigate. Commander Ganse and crews located eight, plus three not previously reported. They found a variety of watery obstructions, and some false alarms.

The entrance to Chesapeake Bay, an expanse of often stormy water through which ships pass on their way to Virginia and Maryland ports, reportedly hid several potentially dangerous wrecks. One, supposedly located 21 nautical miles northeast of Cape Henry, was not found. Crews took the two ships in a one-mile radius—normally they go only a half mile from reported locations—dragging to 65½ feet but found nothing. They recommended that the wreck be listed as not dangerous or removed from existing charts.

Further down the east coast, 24 miles southeast of Cape Henry, Va., the searchers found a hazardous wreck. The clam boat Margaret P. Hanks had sunk in 64 feet of water, but parts of the ship were covered only by 43 feet of water. Commander Ganse recommended that the vessel be listed as dangerous.

Another sunken clam boat, previously unreported, was near the Margaret P. Hanks. The vessel, Captain Rich, also was considered dangerous by Commander Ganse. Her effective depth, or the depth at which she would pose a threat

Steel wire off Heck's port bow is strung through water and attached to sister ship Rude. The ships run parallel courses so that the wire snags on underwater obstacles.

to passing vessels, was 54½ feet.

An unidentified wreck two miles southwest of Key West, Fla. turned out to be part of a coral reef and not potentially dangerous.

Other reported wrecks were not found by crews of the Rude and Heck when they dragged the areas, and recommendations were made to remove them from navigational charts. Among those not found were the Webster, a World War II Liberty ship reported sunk 32 miles east of Cape Henry, Va.; a floating drydock pontoon section reported sunk in 60 feet of water 35 miles east of Elizabeth City, N.C., and an unidentified ship determined in 1955 to be covered by 18 feet of water, eight miles southeast of Cape Lookout, N.C. Conclusion of Commander Ganse was that none of these reported wrecks now presented a danger to navigation.

Finishing their search in the Florida Keys, Rude and Heck returned to Norfolk, Va. for repairs and refitting before setting out again.

Their next assignment took Commander Ganse and the crews of the two ships to the approaches to New York Harbor. At least nine sunken wrecks regarded as dangerous to shipping had been reported in the traffic-congested approaches to the harbor, strung out in an area up to 11 miles off the New York-New Jersey coast and stretching south from a point in the Ambrose Channel about five miles off Rockaway Beach, L.I. to Sea Girt, N.J. Ambrose Channel is a major waterway leading into New York Harbor.

Start of the operation was delayed because of pollution in New York harbor. Divers needed equipment not normally carried to protect them from contamination.

There were many "hangs," or wrecks located during this survey, but most were not considered dangerous. Among those that were, was an unmarked wreck found more than a mile away from its reported position. The wreck had a clearance of only 27 feet.

Divers also found what appeared to be the remains of an engine block and propeller shaft, also only 27 feet below the surface. The wreckage was considered a hazard to navigation and Commander Ganse forwarded the information to the Coast Guard.

Obstructions also had been reported in an area called the New York Bight, a rectangular area approximately 1¼ miles running north-south and 4½ miles running east-west. A foreign tanker had reported it struck wreckage in that area, possibly the remains of a Navy ship.

The wire dragged between Rude and Heck hung on eight obstructions in the vicinity of the buoy marking the wreckage. New markers were put up in the area, in addition to a Coast Guard buoy already marking the wreck.

Other obstructions found in the area might not be hazardous to navigation, but could harm a vessel's anchor. It was recommended that these obstructions be marked on navigational charts.

Crews of the two ships were not able to investigate all items on their New York harbor search schedules. Late autumn's short days and cold water dictated Rude and Heck's return to Norfolk. After repairs and refitting the sister ships will go back to the Chesapeake Bay where they searched in February 1975, then down to the Gulf of Mexico. In the summer of 1976 they will return to the New York area to complete investigation of the wrecks they did not get to last fall.

Wire drag ships have been hanging around since the beginning of this century, finding navigational hazards up and down America's coastlines. There have been many interesting discoveries, including the wrecks of Confederate blockade runners, a 19th century British cargo ship loaded with thousands of pieces of dinnerware, and rusting Civil War cannons.

Crews of ships operated by the National Oceanic and Atmospheric Administration frequently remind mariners in ports they visit to report suspected underwater obstructions. These ships will then investigate and recommend proper action should they find any navigational hazards.

They may not be as exciting as the Loch Ness monster or other terrors of the deep, but hidden hazards in the form of sunken wrecks, shoals, reefs or pinnacle rocks present a real danger to the mariner. As a result of the findings of the Rude and Heck and other National Oceanic and Atmospheric Administration ships, navigational charts will be more accurate. ⚓

Art by YNCS Earl Payne

'Navy Special Delivery'

By Cmdr. William T. Owesney

How can high priority cargo be delivered to a U.S. Navy ship at sea in an emergency? This problem has been addressed by the Navy, and a solution, the Navy Emergency Air Cargo Delivery System, is being developed by Navy.

The system is designed to provide emergency logistic support for surface vessels in remote areas anywhere on the globe. Essen-

tially, it is a method for long-range air delivery, directly to a ship, of an urgently-needed item without which the mission of the ship would be gravely jeopardized. Delivery would be made by an aircraft that can operate worldwide, and cover a much broader radius than the Navy Carrier Onboard Delivery aircraft currently in use.

Scope of the system will include the capability of air-dropping many types of cargo, weighing from 50 to 20,000 pounds. The cargo will be specially rigged, and will be dropped in the water close to the receiving ship, which will then retrieve it. Cargo preparation includes water-proofing, shock-proofing, flotation, packaging, and packing to facilitate retrieval by the Navy ship's crew.

The aircraft-to-ship delivery system is not unique in any sense. Packaging and air cargo drop techniques are employed by other services, and the Navy has had this capability for many years. During the Korean War and the Vietnam conflict, badly needed items often were dropped near ships by patrol aircraft. The new air cargo drop system will structure current procedure and expand capability so that it can be more responsive to an emergency operational requirement.

The system could play an important part in logistical support of sustained operations by a single ship, or by a task unit of several ships operating in remote areas. Need for such a system has become more apparent in light of diminished availability of overseas bases, plus long distances between major logistic support bases and critical deadlines for high priority material, supplies or equipment.

Depending on the size of an operation, the quantity of cargo, and the distance aircraft must fly, the air cargo drop system can be either a Navy or a joint service operation. Both Navy and Air Force have aircraft that could be used. Navy has the P–3 Orion and C–130 Hercules aircraft, and the Air Force the C–130 and C–141 Starlifter.

Army and Air Force have developed standard cargo rigging and delivery procedures which they have been using for many years. The air cargo drop system's new features are supply support requirements, documentation procedures, and unique cargo preparation necessary to provide flotation. New retrieval procedures also have been developed and incorporated into the system.

Development of the air cargo drop system was begun after Adm. Isaac C. Kidd, Jr., chief of Naval Material, observed Air Force aircraft dropping equipment to Army troops. He tasked the Naval Supply Systems Command with developing a similar capability for the Navy.

In October 1973, a small group of highly specialized people was formed at the Naval Ship Research and Development Center in Carderock, Md. This team began a series of tests to determine feasibility of air dropping Navy cargo to fleet ships. Headed by Mr. Maury Zubkoff and Mr. Russell Putnam, the team began developing and testing improved methods of cargo preparation for air-drop and retrieval at sea.

In February 1974, testing began by simulating a cargo air drop from a crane into the water. Static tests were conducted at the Naval Supply Center, Cheatham Annex, Williamsburg, Va., using the talents and facilities of the Navy Cargo Handling and Port Group and the Naval Logistic Engineering Group.

The tests were designed to develop water-proofing, shock-proofing, flotation and retrieval techniques, and to simulate the impact that might be expected with a parachute descent. Delicate equipment (two klystrons and two magnetrons) was dropped and retrieved with no damage. Equipment was tested before and after the drops to verify its condition.

Actual air drops began in August 1974. The tests were conducted at the National Aeronautics and Space Administration Wallops Island Test Range using Marine Corps riggers and Marine KC–130 aircraft. The first test was designed to develop rigging details and retrieval techniques using a floatable line, or sea painter. The 100-foot-long sea painter is tied to the base of the cargo package. Once the cargo hits the water, the

chute automatically detaches and the floating sea painter is snared by a seaman on the recovery ship casting a grappling hook. The cargo package is then hoisted aboard using the sea painter as a lifting line.

Standard cargo packaging equipment was used in the test. A standard cargo sling, or bag, will accommodate payloads weighing from 50 to 300 pounds, in standard boxes up to 30x30x60 inches. Loads ranging from 500 to 1,600 pounds are packed in larger, parrafin impregnated, fiberboard containers and packaged as a cargo bag mounted on a skid board.

Cargo packages consisting of canned goods rigged in cargo bundles were dropped. The retrieval technique worked well in each instance. These tests were repeated later using National Aeronautics and Space Administration telemetry and Naval Ship Research and Development Center loads to measure magnitude of imposed forces. Data obtained revealed that the unloading gravitational pull on the cargo, while transient, was greater than expected.

The next series of tests was designed to evaluate procedures for dropping large, heavy loads. The loads were configured by rigging six units on a standard Air Force cargo platform 12 feet long by 9 feet wide. The Air Force was invited to participate in this series of tests at Wallops Island. C–130 and G–141 aircraft were flown by Air Force crews. Marine Corps personnel rigged heavy loads of 8,000 and 17,800 pounds. At that time, the 17,800-pound load was the largest ever dropped from a C–141 jet cargo aircraft. A Coast Guard buoy tender was used as the retrieval vessel. The tests again were successful, proving that large cargo loads could be air dropped to Navy ships far off shore in an emergency.

In October 1974 more tests were conducted during a fleet exercise, using Air Force C–130 aircraft to drop dummy loads ranging from 100 to 1,600 pounds to the Destroyer Escorts USS Connole, USS Edward McDonnell, and USS Paul, located 100 nautical miles east of Mayport, Fla. The purpose of these tests was to evaluate small ship retrieval capability, and to develop ship and aircraft tactics for air cargo drops. Some high wind and sea conditions (up to State 4) were experienced during these tests, but no insurmountable problems were encountered.

In late 1974, large "live" loads were dropped to the USS Nashville. Air Force C-130 aircraft again were used for the drop. The Army Airborne Communications and Electronics Board from Fort Bragg, N.C. did the rigging. Loads consisted of varied types of equipment, mostly delicate electronic gear, which could be expected to be needed by fleet ships. The equipment was drawn from normal Navy supply stocks.

Two 4,900-pound loads were packed, rigged and parachuted to USS Nashville. One was retrieved "over-the-side," using the ship's crane, and the second load was retrieved through the well-deck. The well-deck was flooded and the cargo floated inside. Both operations were successful but 55 minutes were required for the well-deck retrieval as compared to 21 minutes (aircraft to ship deck) for over-the-side retrieval.

All payload items survived the air drop and the retrieval of cargo from the sea went smoothly. Smaller loads of the same types of equipment were successfully dropped to the USS New. All tests were planned and conducted during a period of approximately three weeks, since personnel involved were by then familiar with the system.

Participation in these tests by the Army, Air Force, Coast Guard, Navy and Marine Corps made it possible to gain a wealth of information about special cargo preparation, cargo delivery and retrieval methods, and suitability of the system for joint service operations. A total of 25 air cargo drops have been conducted to date with a high degree of success. These drops have proven the feasibility of the system while pointing the way for further testing and development needed to refine the system for operational use.

In December 1974 the chief of naval material designated the Naval Air Systems Command as the principal development activity for an emergency logistic support system for surface vessels. Naval Air Systems Command has established a plan of action and set milestones to provide the Navy with an operational system by late 1976.

The system will be developed by expanding and refining the Navy Emergency Air Cargo Delivery System. The types of cargo to be considered for air drop will be those mission essential items needed quickly in an emergency situation, which cannot be delivered on time by any other method. The system is not intended to replace or diminish any existing cargo delivery method since air drops are not considered a cost effective method of delivering cargo, except in emergency situations.

The system will be controlled by specific procedures. When a decision is made to use air cargo drop, the cargo will be specially marked and shipped in accordance with established procedures. It will move quickly to a staging base, be prepared and rigged for air drop, loaded aboard the delivery aircraft, flown to the drop zone, and parachuted to the receiving ship. Depending upon the quantity and weight of the cargo and the distance involved, either Navy or joint service assets may be employed. The Navy and Marine Corps can handle anything compatible with C–130. For heavier cargo and longer ranges, the Air Force C–141 will be used.

The Air Force has expressed interest in assisting Navy with the

air cargo drop system. As a result of their participation in the test program, Air Force has put together a guide which describes the capability of the Military Airlift Command to support worldwide utilization of the Navy air cargo drop system. The information includes capabilities of the C–141A and C–130E aircraft, Air Force aerial delivery procedures, proposed test profiles, and aircraft procedures. This guide will greatly assist final development of the Navy Emergency Air Cargo Delivery System.

The Air Force has been dropping cargo for the Army for many years, and both services have detailed documentation of equipment needed, and of rigging techniques and problems typically encountered. In developing the air cargo drop system, the Navy will take advantage of Army-Air Force experience to insure compatibility with present air drop techniques and equipment.

Retrieval is solely a Navy problem, however. Once the cargo hits the water, the ship has the job of retrieving it. That is not a simple task. Ships have a wide variation in cargo retrieval capability in the open sea, depending to a great extent on cargo handling equipment aboard each ship. A combat ship with a small lift capability, for example, would have a difficult time trying to recover a 5,000-pound package floating in the water.

Obviously, cargo preparation must take into account the type of ship on the receiving end, and limitations posed by its retrieval equipment. Since some ships have helicopters on board, helicopter cargo retrieval from the open sea also will be studied.

For the next 18 months, the program manager of Naval Air Systems Command and the technical manager of the Naval Ship Research and Development Center will continue to perfect the air cargo drop system to provide Navy with a back-up emergency system that can be used anywhere on the globe. Specific cargo preparation and handling procedures will be developed and documented. Training and personnel requirements will be identified. Cargo retrieval methods also will be refined and joint service procedures will be devised. A manual will be written and distributed to all commands and activities concerned so that when an emergency delivery is needed, the Navy Emergency Air Cargo Delivery System will be operating smoothly and efficiently.

Although it is primarily a Navy project, the Navy Emergency Air Cargo Delivery System is a product of cooperation between Navy, Air Force, Marine Corps, Coast Guard and Army personnel. Speedy, efficient and safe, the air cargo drop system will require very little new equipment, and will help fulfill Navy fleet needs for a long-range emergency logistic support capability. ⚓

Cmdr. William T. Owesney did undergraduate work in mechanical engineering at Ohio State University and holds a bachelor's degree from the U.S. Naval Postgraduate School, Monterey, Calif. As a naval aviator he has served in attack squadrons and as assistant program manager for aviation systems for USS Nimitz and USS Eisenhower. He is a 1973 graduate of the College of Naval Warfare. Now retired he formerly headed the human factors engineering and crew station design branch of the crew systems division of the Naval Air Systems Command headquarters.

Norwegian sloop Restaurationen was the model for this Seafaring Tradition commemorative envelope, first in a series of Bicentennial envelopes issued by the U.S. Postal Service. Restaurationen brought the first Norwegian immigrants, called Sloopers, to America 150 years ago. These and other commemorative envelopes depict American occupations that formed the basis of the U.S. economy. Future subjects will include farming, homemaking, craftsmanship and medicine. Sold in sets of two, one large and one small, envelopes cost 24 cents per set and can be ordered from U.S. Postal Service, Philatelic Sales Division, Washington, D.C. 20265. The envelope has 10-cent postage printed on in the style of a compass rose, and needs an additional 3-cent stamp to be mailed.

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